



## Pain

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# A comparative study of oxycodone and morphine in a multi-modal, tissue-differentiated experimental pain model

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## Abstract

Visceral **pain** can be difficult to treat with classical  $\mu$ -opioid **agonists** and it has been suggested to use **opioids** with distinct pharmacological profiles. In **animal** experiments, **oxycodone** has shown different effects compared to **morphine**, and **clinical observations** have shown that **oxycodone** may occasionally be superior to, e.g., **morphine** in the treatment of visceral **pain**. In the current study, we randomised 24 **healthy subjects** to treatment with either **morphine** (30 mg), **oxycodone** (15 mg) or placebo in a **crossover study**. The **experimental pain** model involved multi-modal (mechanical, thermal and electrical) **pain** tests in the skin, **muscles** and **viscera**. The **pain** tests were carried out at baseline and 30, 60 and 90 min after **oral administration** of the **drugs**. The model showed effect of the two **opioids** compared to placebo on all **stimulus** modalities in all three types of **tissues** (all  $P$  values  $<0.001$ ). Both **opioids** attenuated the sensory response mainly to painful **stimulations**. Morphine and **oxycodone** were equipotent in pain **modulation** of the skin and muscles, but oxycodone had superior **analgesic** effect to both **morphine** and placebo on the mechanical ( $P < 0.001$ ) and thermal ( $P < 0.001$ ) **stimulations** of the **oesophagus**. In conclusion, the multi-modal and tissue-differentiated pain model could link findings from animal experiments to **clinical findings**. A different pharmacological profile of oxycodone compared to that of morphine was shown, and thus oxycodone may be a useful alternative to morphine in the treatment of visceral pain syndromes.



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## Keywords

Experimental pain; Visceral pain; Oxycodone; Morphine

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